WATER RESOURCES REVIEW for

APRIL
1976

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

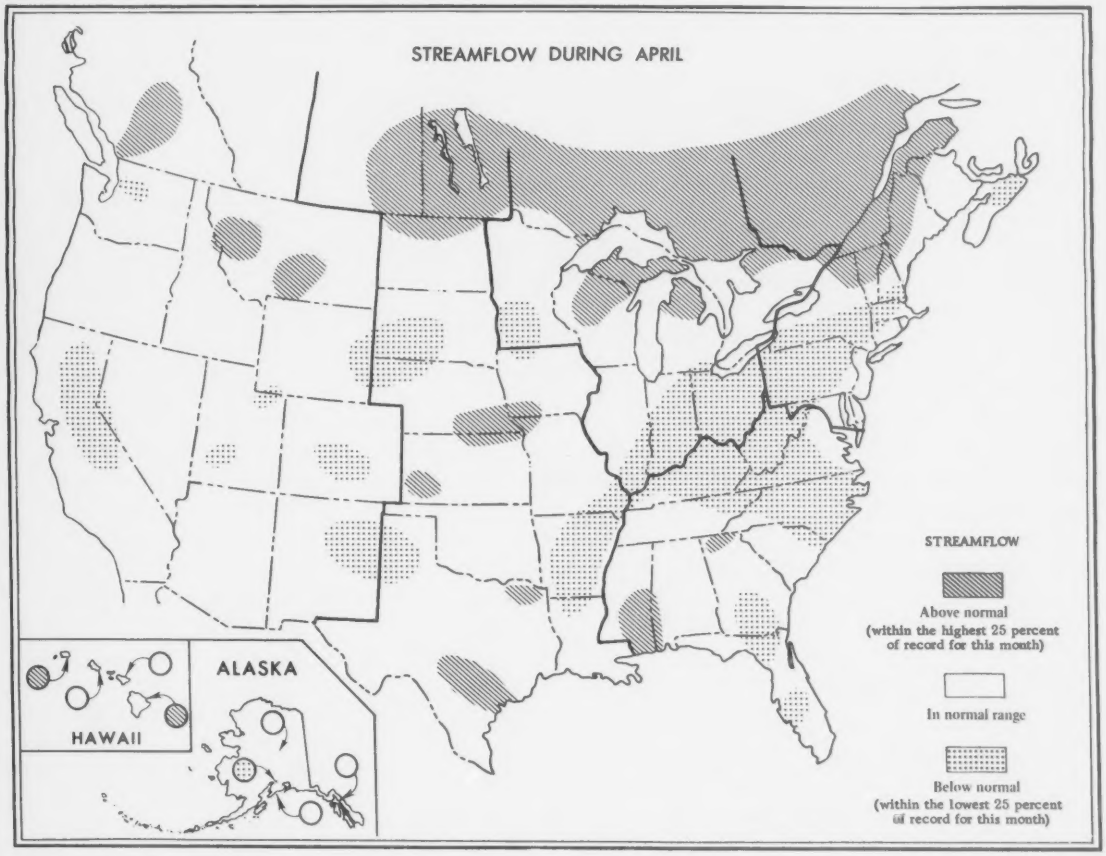
CANADA
DEPARTMENT OF THE ENVIRONMENT
WATER RESOURCES BRANCH

STREAMFLOW AND GROUND-WATER CONDITIONS

Streamflow generally increased seasonally in southern Canada, and in many northern, central, and western States. Flows generally decreased in the eastern States, in parts of some south-central, north-central, and west-coast States, and were variable in Alaska and Hawaii.

Monthly mean flows remained in the above-normal range in parts of Michigan, Wisconsin, the New England States, New Brunswick, and Quebec, and increased into that range in parts of Saskatchewan, Manitoba, and Ontario. Flows remained in the below-normal range in a large area in southern California, and in smaller areas in some central and southern States, and decreased into that range in many east-central States and part of Nova Scotia.

Flooding occurred in Iowa, Kansas, Manitoba, Missouri, North Dakota, and Oklahoma. Monthly or daily mean discharges were lowest of record for the month in parts of Alaska, Arizona, California, North Carolina, and West Virginia, and highest of record for the month in parts of Maine. Daily mean flow of St. Lawrence River at La Salle, Quebec, was highest of record.



NORTHEAST

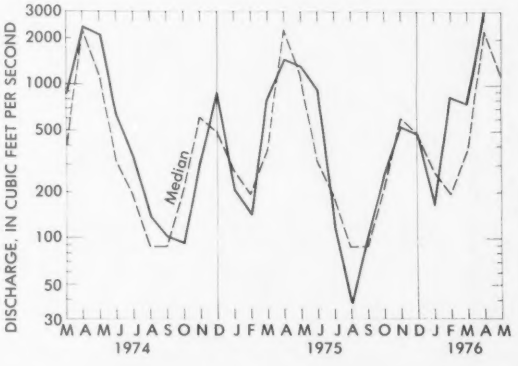
[Atlantic Provinces and Quebec; Delaware, Maryland, New York, New Jersey, Pennsylvania, and the New England States]

STREAMFLOW INCREASED SEASONALLY IN NEW BRUNSWICK AND QUEBEC, AND IN PARTS OF THE NEW ENGLAND STATES AND NEW YORK, BUT GENERALLY DECREASED IN THE CENTRAL AND SOUTHERN PARTS OF THE REGION. MONTHLY MEAN FLOWS REMAINED ABOVE THE NORMAL RANGE IN PARTS OF QUEBEC AND NEW YORK AND REMAINED BELOW THAT RANGE IN PARTS OF DELAWARE, MARYLAND, AND PENNSYLVANIA. IN THE NORTH-CENTRAL PART OF THE REGION, THE LEVEL OF LAKE CHAMPLAIN (RICHELIEU RIVER, TRIBUTARY TO ST. LAWRENCE RIVER) AT ROUSES POINT, NEW YORK, REACHED ITS SEASONAL PEAK ON APRIL 15, ABOUT ONE-HALF FOOT LOWER THAN THE MAXIMUM KNOWN LEVEL SINCE AT LEAST 1827. IN THE ADJACENT AREA OF SOUTHEASTERN QUEBEC, THE DAILY MEAN FLOW OF ST. LAWRENCE RIVER AT LA SALLE, ON APRIL 2, WAS THE HIGHEST OBSERVED IN RECORD THAT BEGAN IN 1955.

The seasonal peak of 101.62 feet above mean sea level that occurred at 1800 hours on April 15 in Lake Champlain at Rouses Point, New York, was only 0.18 foot lower than the level observed on March 30, 1903, which was the previous maximum level observed at that site since records began in October 1863. The maximum known elevation since at least 1827 was 102.1 feet above mean sea level on May 4, 1869. The outflow from Lake Champlain reaches St. Lawrence River through Richelieu River in southern Quebec. At the index station, St. Lawrence River near LaSalle, Quebec, about 60 miles upstream from the mouth of Richelieu River, the monthly mean discharge of 446,000 cfs, and the daily mean of 516,000 cfs on April 2, were highest for the month since records began in 1955. Elsewhere in Quebec, monthly mean flows increased seasonally and were above the normal range at all other index stations. In the eastern part of the Province, north of St. Lawrence River, where monthly mean discharge of Outardes River at Outardes Falls was in the below-normal range and about one-half of median in March, flow increased sharply into the above-normal range and was nearly 3 times the median for April. In the extreme southern part of the Province, south of St. Lawrence River, monthly mean flow of St. Francois River at Hemming Falls also increased sharply, and remained above the normal range for the 3d consecutive month.

In the adjacent Province of New Brunswick, monthly mean flows increased seasonally and remained within the normal range. By contrast, in central Nova Scotia, monthly mean discharge of St. Marys River at Stillwater decreased contraseasonally and was below the normal range for April.

In the New England States, monthly mean flows generally decreased seasonally in Connecticut and Rhode Island and were variable in Maine, Massachusetts, New Hampshire, and Vermont. Flow of Ware River at Coldbrook, Mass., decreased contraseasonally and the monthly mean was below the normal range for the first time since May 1975. In central Vermont, where monthly mean discharge of White River at West Hartford was above the normal range in 6 of the past 7 months, flow increased slightly but the monthly mean was less than the April median discharge and was in the normal range. In central Maine, monthly mean discharge of Piscataquis River near Dover-Foxcroft increased seasonally and remained above the normal range for the 3d consecutive month (see graph). In the northern part of the State, runoff from early snowmelt augmented by rains, resulted in a monthly mean discharge of 52,600 cfs in St. John River below Fish River, at Fort Kent (drainage area, 5,690 square miles), highest for April since records began in 1927. In southern Maine, monthly mean flow of Little Androscoggin River near South Paris also increased seasonally but was slightly below median for the month.



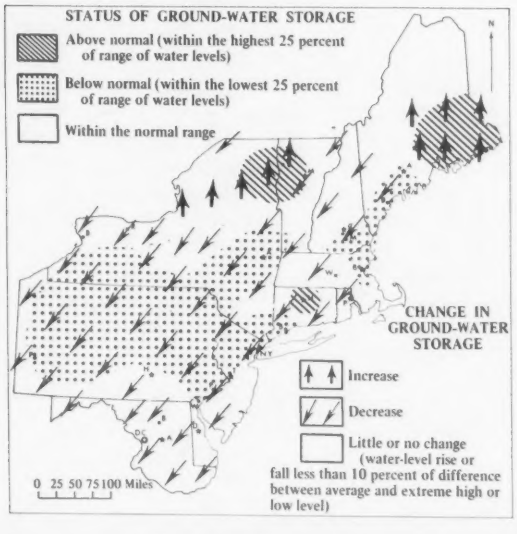
Monthly mean discharge of Piscataquis River near Dover-Foxcroft, Maine (Drainage area, 297 sq mi; 769 sq km)

In northwestern and south-central parts of New York State, monthly mean flows of West Branch Oswegatchie River near Harrisville and Susquehanna River at Conklin, respectively, decreased contraseasonally and were well below the normal range. In the eastern part of the State, mean flow of Hudson River at Hadley increased seasonally during April and remained above the normal range for the 3d consecutive month.

In the southern part of the region, monthly mean discharge of Seneca Creek at Dawsonville, in central

Maryland, increased contraseasonally, was almost twice the April median, and was in the above-normal range. By contrast, in the eastern part of the State, mean flow of Choptank River near Greensboro decreased seasonally, was about one-third of median, and remained below the normal range. In Pennsylvania, monthly mean flows decreased, were about one-half of median, and were below the normal range at all index stations. Similarly, in the Delaware River basin in northeastern Pennsylvania and adjacent parts of New York and New Jersey, monthly mean flow of Delaware River at Trenton, N.J., decreased contraseasonally, was about one-half of median, and was in the below-normal range. In northern and southern parts of New Jersey, monthly mean flows in South Branch Raritan River near High Bridge and Great Egg Harbor River at Folsom, respectively, decreased seasonally and were near median for the month.

Ground-water levels declined in most of the region, but rose in part of northeastern New York State and in east-central Maine (see map). Monthend levels were below average in the south-central part of the region and also in some near-coastal parts of northeastern Massachusetts, southeastern New Hampshire, and southwestern Maine. Levels in some wells were lowest for end of April in more than 20 years in parts of New York and Pennsylvania but were above the seasonally extreme low levels that sometimes occur during late summer and early autumn. In only a few areas were levels above average, continuing from March – notably east-central Maine, north-central Connecticut, northern Vermont, and adjoining part of northeastern New York State.



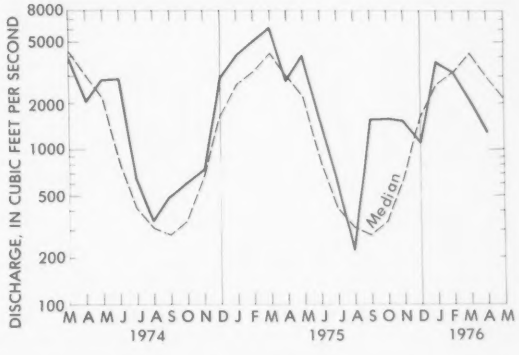
Map shows ground-water storage near end of April and change in ground-water storage from end of March to end of April.

SOUTHEAST

[Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia]

STREAMFLOW GENERALLY DECREASED SEASONALLY IN ALL PARTS OF THE REGION, BUT INCREASED IN SMALL AREAS IN ALABAMA, MISSISSIPPI, NORTH CAROLINA, AND VIRGINIA. FLOWS REMAINED IN THE BELOW-NORMAL RANGE IN PARTS OF ALL STATES IN THE REGION EXCEPT ALABAMA, KENTUCKY, AND MISSISSIPPI, AND DECREASED INTO THAT RANGE IN KENTUCKY. DAILY MEAN FLOWS WERE LOWEST FOR THE MONTH IN PARTS OF NORTH CAROLINA AND WEST VIRGINIA.

In eastern West Virginia, where mean discharge of Greenbrier River at Alderson (drainage area, 1,357 square miles) during March was less than one-half median and below the normal range, flow in April continued to decrease seasonally, was only 43 percent of median, and remained in the below-normal range (see graph). At monthend the daily mean discharge of 395



Monthly mean discharge of Greenbrier River at Alderson, W. Va. (Drainage area, 1,357 sq mi; 3,515 sq. km)

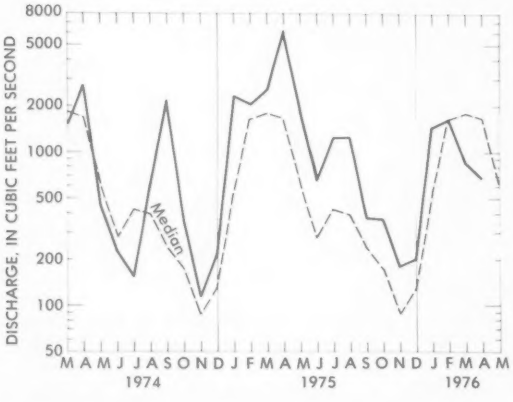
cfs was lowest for April since record began in July 1895. The previous minimum daily mean discharge in April was 442 cfs in 1942. In the western and northern parts of the State, monthly mean flows in Kanawha River at Kanawha Falls and Potomac River at Paw Paw, respectively, also decreased seasonally, were about one-half of the April median, and below the normal range for the 2d consecutive month.

Similarly, in southeastern Virginia, monthly mean discharge in Nottaway River near Stony Creek decreased seasonally, was about one-half median, and in the below-normal range. At other index stations in Virginia, monthly mean flows increased and generally were about median.

In north-central North Carolina, where mean flow of Neuse River near Clayton (drainage area, 1,140 square miles) was below the normal range in February and March (about one-third of median in March), flow continued to decrease seasonally and remained below the normal range. The daily mean discharge of 220 cfs on April 30 was lowest for the month in record that began in August 1927. In the central part of the State, monthly mean flows in Cape Fear, Pee Dee, and South Yadkin Rivers also decreased seasonally and remained below the normal range. At the index station, Cape Fear River at William O. Huske Lock near Tarheel, where mean discharge during March was in the below-normal range and less than one-half median, flow continued to decrease seasonally and the monthly mean was about one-third of the median for April.

In South Carolina, monthly mean discharge of Pee Dee River at Peedee remained in the below-normal range for the second consecutive month, and in the adjacent basin of Lynches River, monthly mean flow at the index station at Effingham decreased into that range and was only 43 percent of the median flow for April.

In south-central Georgia, monthly mean flow of Alapaha River at Statenville decreased seasonally and remained in the below-normal range (see graph), and in



Monthly mean discharge of Alapaha River at Statenville, Ga. (Drainage area, 1,400 sq mi; 3,626 sq km)

the extreme northwestern part of the State, mean flow in Etowah River at Canton also decreased seasonally but remained in the above-normal range as a result of high carryover flow from March, augmented by runoff from several periods of rainfall in April.

In west-central Florida, monthly mean discharge of Peace River at Arcadia decreased seasonally, was only 28 percent of median, and remained in the below-normal range for the 4th consecutive month. In the southwestern part of the State, flow southward through the Tamiami Canal outlets, 40-mile bend to Monroe, ceased during the month. At Miami, in southeastern Florida, flow in Miami Canal also ceased. In the northern part of the State, monthly mean flow in Suwannee River decreased contraseasonally and was below the normal range. Also in northern Florida, the discharge of Silver Springs increased 30 cfs, to 695 cfs; 85 percent of normal.

In Alabama, monthly mean flows generally decreased seasonally except in the southeastern part of the State, where flow of Conecuh River at Brantley increased contraseasonally but remained within the normal range.

In southeastern Mississippi, flows increased contraseasonally in the Pascagoula and Pearl Rivers and monthly mean discharges, as measured respectively at Merrill, Miss., and near Bogalusa, La., were in the above-normal range and more than twice the respective median flows for April.

In Tennessee, monthly mean flows decreased at all index stations but were in the normal range, except in Emory River at Oakdale where monthly mean discharge was about one-half the April median and was below the normal range for the 3d consecutive month. Statewide rainfall was reported to be about 25 percent of normal.

In Kentucky, where monthly mean flows at both index stations were less than median but within the normal range in March, flows decreased seasonally and were below the normal range in April. Monthly mean discharge of Licking River at Catawba was only 50 percent of the April median flow.

The unusually low flows in tributaries of the Ohio River in West Virginia and Kentucky were reflected in the monthly mean discharge of 93,600 cfs in Ohio River at Louisville, Ky. (drainage area, 91,170 square miles) which is only 49 percent of median, and in the below-normal range for the first time since April 1971.

Ground-water levels declined in most of the Southeast, but changed only slightly in Kentucky. Levels rose in the Piedmont of central Georgia and in the mountain area of western North Carolina. Monthend levels were above average in western North Carolina and in southwestern West Virginia; and were below average in most of the remainder of West Virginia as well as in eastern and central North Carolina, southeastern Florida, and in the Jackson and coastal areas of Mississippi.

WESTERN GREAT LAKES REGION

[Ontario; Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin]

STREAMFLOW INCREASED SEASONALLY IN MINNESOTA AND WISCONSIN, AND IN PARTS OF

MICHIGAN. FLOWS REMAINED IN THE ABOVE-NORMAL RANGE IN PARTS OF MICHIGAN AND WISCONSIN, INCREASED INTO THAT RANGE IN PARTS OF ONTARIO, AND DECREASED INTO THE BELOW-NORMAL RANGE IN INDIANA AND OHIO AND IN PARTS OF ILLINOIS. SEVERE LAKESHORE FLOODING OCCURRED IN THE SAGINAW BAY AREA OF EASTERN MICHIGAN AS A RESULT OF STRONG ONSHORE WINDS ON LAKE HURON.

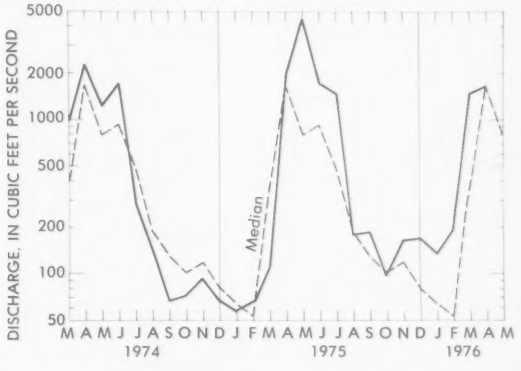
Monthly mean flows decreased sharply and were below the normal range in streams tributary to Ohio River in the southeastern part of the region. For example, mean flow in Scioto River at Higby, Ohio (drainage area, 5,131 square miles) decreased from 5,050 cfs in March (in the normal range) to 1,752 cfs in April, in the below-normal range and only 24 percent of median. Similarly, in Indiana, where monthly mean discharges in East Fork White River at Shoals and Mississinewa River at Marion were in the normal range in March, mean flows during April decreased into the below-normal range and were only 31 and 23 percent of median, respectively. Also, in Indiana and the adjacent area of Illinois, monthly mean flow of Wabash River, as measured at Mt. Carmel, Ill., decreased from 56,640 cfs in March (in the normal range) to 19,990 cfs in April, in the below-normal range and only 43 percent of median for the month. These reduced flows, combined with those in other tributaries to Ohio River, such as Allegheny and Monongahela Rivers in Pennsylvania and Kanawha River in West Virginia, contributed to a sharp decrease in flow in Ohio River, as measured at Louisville, Ky., where the monthly mean discharge in April was in the below-normal range for the first time since April 1971.

In the northern part of Michigan's Lower Peninsula, where the monthly mean discharge of 3,752 cfs during March at the index station, Muskegon River at Evart (drainage area, 1,450 square miles) was highest for the month, and the daily mean discharge of 7,710 cfs on March 29 was the highest for any day of the year, in 46 years of record, monthly mean flow decreased in April but was in the above-normal range for the 3d consecutive month and for the 9th time in the past 11 months. In the western part of Michigan's Upper Peninsula, monthly mean flow of Sturgeon River near Sidnaw increased seasonally and remained above the normal range for the 3d consecutive month.

In central Wisconsin, high carryover flow from March, augmented by increased runoff from rains near month-end, resulted in monthly mean discharges that were above the normal range for the 3d consecutive month on Oconto River near Gillett and Wisconsin River at Muscoda, and for the 6th consecutive month on Chippewa River at Chippewa Falls. In the extreme southeastern part of the State, rapid runoff from rains April 24–25 resulted in a peak discharge in Root River Canal near Franklin on the 25th that was the 3d highest since records began in October 1963.

In east-central Illinois, mean flow of Sangamon River at Monticello was only one-half of median during April, but in the northern part of the State, flows in Rock River basin were near or slightly greater than the April medians.

In Minnesota, monthly mean flows increased seasonally at all index stations and were in the normal range except in the southwestern part of the State, where the mean discharge of 3,698 cfs in Minnesota River near Jordan (drainage area, 16,200 square miles) was only 46 percent of median and in the below-normal range. In the central part of the State, where monthly mean discharge of Crow River at Rockford was in the above-normal range and 2 to 4 times median from December 1975 through March 1976, mean flow in April was in the normal range and slightly less than median (see graph).



Monthly mean discharge of Crow River at Rockford, Minn. (Drainage area, 2,520 sq mi; 6,530 sq km)

In southern Ontario, monthly mean flows in the English and Missinaibi River basins increased seasonally and were well above the normal range. At the index station, Missinaibi River at Mattice, in the eastern part of the Province, the monthly mean discharge of 12,700 cfs was more than two times the April median.

Ground-water levels rose in the northern part of the region and generally declined in the southern part. Monthend levels continued below average in most of Minnesota and above average in much of Michigan; and were near average in Wisconsin. In Ohio, levels were near average in the northeastern part and were below average in the central part. In Minnesota, in the heavily pumped

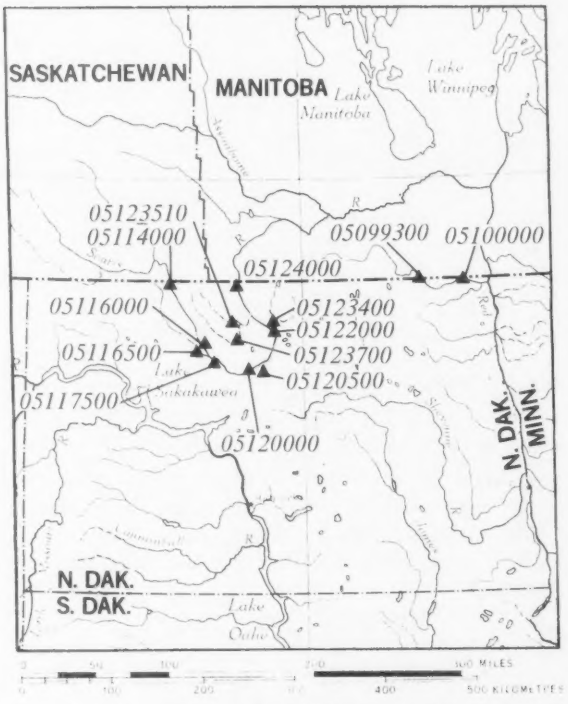
Minneapolis – St. Paul area, levels started to decline in wells tapping the Prairie du Chien–Jordan aquifer and continued rising in the deeper Mt. Simon-Hinckley aquifer; levels remained below average in both aquifers.

MIDCONTINENT

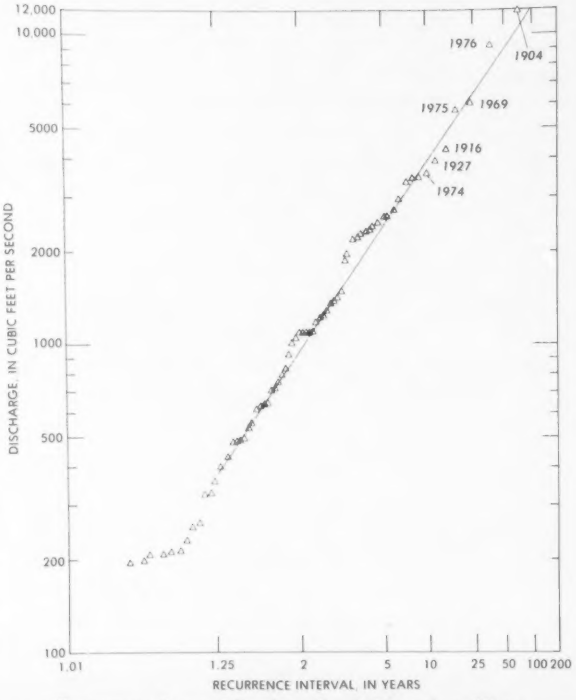
[Manitoba and Saskatchewan; Arkansas, Iowa, Kansas, Louisiana, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota, and Texas]

STREAMFLOW INCREASED SEASONALLY IN MUCH OF THE REGION BUT DECREASED IN PARTS OF IOWA, ARKANSAS, LOUISIANA, TEXAS, NEBRASKA AND SOUTH DAKOTA. FLOWS REMAINED ABOVE THE NORMAL RANGE IN PARTS OF MANITOBA AND SASKATCHEWAN AND INCREASED INTO THAT RANGE IN PARTS OF NORTH DAKOTA, KANSAS, MISSOURI, AND TEXAS. BELOW-NORMAL FLOWS PERSISTED IN PARTS OF NEBRASKA AND SOUTH DAKOTA AND DECREASED INTO THAT RANGE IN PARTS OF IOWA, ARKANSAS, AND LOUISIANA. FLOODING OCCURRED IN NORTH DAKOTA, IOWA, KANSAS, MANITOBA, MISSOURI, AND OKLAHOMA.

Severe flooding occurred in North Dakota and southern Canada along the Pembina and Souris Rivers as a result of rapid melting of the heavy snowpack. Hundreds of thousands of acres of farmland were inundated, about 12,000 persons were evacuated from homes in Minot, and nine counties in North Dakota were declared disaster areas. Total flood damage reportedly may be as much as 10 million dollars. The maximum peak discharges for the period of record occurred at five of the six Souris River stations in North Dakota. The accompanying map, and table on page 7, show peak stage and discharge data and locations of the measurement sites in Manitoba and North Dakota described in the table. The relationship between flood-peak discharge and recurrence interval for major floods (greater than about 4,000 cfs) on Souris River above Minot, North Dakota, is approximated by the accompanying graph of annual peak discharge at the gaging station above Minot versus recurrence interval. Flood peaks at this station have been affected by storage in Lake Darling, 41 miles upstream, since 1936, and by storage in several smaller reservoirs; the peak discharges shown on the graph are unadjusted values. This graph shows that the peak discharge of April 17, 1976, at this gaging station was roughly equal to that of a 50-year flood. Recurrence intervals for the peak discharges of April 10–27, 1976 at other gaging stations on Souris River (page 7), also are estimated to be about 50 years. Flow in the remainder of North Dakota was in the normal range.



Location of stream-gaging stations in Manitoba and North Dakota described in table of peak stages and discharges.



Frequency of annual floods on Souris River above Minot, North Dakota.

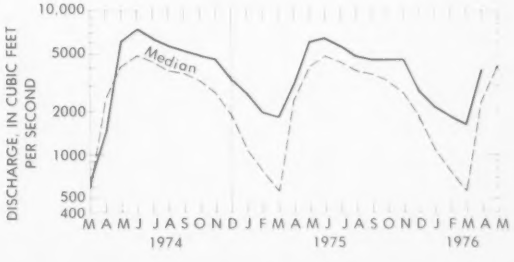
STAGES AND DISCHARGES ON SELECTED STREAMS FOR THE FLOODS OF MARCH AND APRIL 1976 IN MANITOBA AND NORTH DAKOTA

WRD station number	Stream and place of determination	Drainage area (square miles)	Period of known floods	Maximum flood previously known			Maximum during present flood			
				Date	Stage (feet)	Discharge (cfs)	Date	Stage (feet)	Discharge	
									Cfs	Cfs per square mile
RED RIVER (OF THE NORTH) BASIN										
05099300	Pembina River near Windygates, Manitoba.[a]	3,020	1962–	Apr. 26, 1974	19.50	11,500	Apr.17	13.34	4,100	1.4
05100000	Pembina River at Neche, N. Dak.	3,410	1903–8, 1909–15, 1919–	Apr. 20, 1950	21.58	10,700	19	19.82	4,400	1.3
05114000	Souris (Mouse) River near Sherwood, N. Dak.	8,940 [b]3,040	1930–	Apr. 11, 1969	24.72	12,400	10	25.10	16,000	5.3
05116000	Souris River near Foxholm, N. Dak.	9,470 [b]3,270	1936–	Apr. 17, 18, 1969	15.84	5,380	17	17.18	[c]8,000	2.7
05116500	Des Lacs River at Foxholm, N. Dak.	939 [b]539	1904–6 1945–	Apr. 30, 1970	20.71	3,660	Mar.24	[d]16.61	1,550	2.9
05117500	Souris River above Minot, N. Dak.	10,600 [b]3,900	1903–	Apr. 20, 1904	23	12,000	Apr.17	21.30	9,350	2.4
05120000	Souris River near Verendrye, N. Dak.	11,300 [b]4,400	1937–	Apr. 30, 1969	17.05	5,960	19	17.84	9,900	2.2
05120500	Wintering River near Karlsruhe, N. Dak.	705 [b]285	1937–	Apr. 7, 1949	[e]12.0	3,000	Mar.26	[d]8.80	800	2.8
05122000	Souris River near Bantry, N. Dak.	12,300 [b]4,700	1937–	May 25, 1975	13.90	5,750	Apr.22	14.58	9,280	2.0
05123400	Willow Creek near Willow City, N. Dak.	1,160 [b]730	1956–	Apr. 12, 1969	16.76	5,900	4	15.94	2,950	4.0
05123510	Deep River near Upham, N. Dak.	975 [b]370	1951, 1958–	Apr. 12, 1969	18.18	6,760	3	17.58	4,400	11.9
05123700	Cut Bank Creek at North Lake Outlet near Granville, N. Dak.	534 [b]244	1956–	Apr. 14, 1969	3.78	339	Mar.30	4.46	700	2.9
05124000	Souris River near Westhope, N. Dak.	16,900 [b]6,600	1930–	May 7, 1975 Apr. 19, 1969	16.66 17.56	6,700	Apr.27	19.20	12,000	1.8

[a] An international gaging station maintained by Canada under agreement with the United States.
[b] Approximate contributing area.
[c] Occurred on April 16.
[d] Affected by backwater from ice.
[e] Channel choked by packed snow.

In south-central Manitoba, monthly mean discharge in Waterhen River below Waterhen Lake increased seasonally and remained in the above-normal range for the 8th consecutive month (see graph). In adjacent Saskatchewan, flow at the index station, Qu'Appelle River near Lumsden, increased seasonally and was in the above-normal range.

In South Dakota, monthly mean discharge in Bad River near Fort Pierre decreased seasonally and remained in the below-normal range for the second consecutive month. Flows in the remainder of the State were in the normal range.

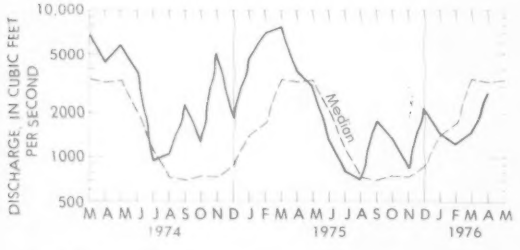


Monthly mean discharge of Waterhen River below Waterhen Lake, Manitoba (Drainage area, 22,000 sq mi; 56,980 sq km)

In northwestern Nebraska, flow of Niobrara River above Box Butte Reservoir decreased seasonally, was below median for the 11th consecutive month and in the below-normal range. In the northeastern part of the State, monthly mean discharge of Elkhorn River at Waterloo decreased seasonally and remained in the normal range.

In southeast Iowa, extensive lowland flooding occurred following heavy rains on April 23–24, with peak discharges on the order of 5- to 20-year recurrence intervals. In northwest Iowa, flow at the index station, Des Moines River at Fort Dodge, decreased contraseasonally to 50 percent of median and was in the below-normal range. Monthly mean discharge at the remaining index stations in the State was above median and in the normal range.

In northwest Missouri, flow of Grand River at Gallatin increased sharply, was over 5 times the median flow for April, and was in the above-normal range. In the southern part of Missouri, monthly mean discharge of Gasconade River at Jerome increased contraseasonally, was 84 percent of median, and in the normal range (see graph). Flooding occurred along the Fox and Fabius Rivers in northeast Missouri as a result of runoff from heavy rains on April 24–26.



Monthly mean discharge of Gasconade River at Jerome, Mo.
(Drainage area, 2,840 sq mi; 7,360 sq km)

In Kansas, rapid runoff from intense rainfall of as much as 8 inches in 24 hours resulted in flooding in parts of the Arkansas River basin in the southwestern part of the State near monthend. The peak stage of 25.5 feet, and discharge of about 10,000 cfs, on April 28 in North Fork Cimarron River tributary near Richfield (contributing drainage area, 58.9 square miles) was highest in record that began in 1957. This peak discharge is 1.3 times the 100-year flood. Downstream, in North Fork Cimarron River at Richfield (drainage area, 463 square miles), the peak stage of 17.5 feet and peak discharge of about 10,000 cfs, on April 27, were highest in record that began in 1971. Monthly mean flow at the index station, Little Blue River near Barnes, increased sharply to over 2 times median and was in the above-normal range. Elsewhere in the State, streamflow was normal and the prolonged dry spell of the last nine months was broken as moderate to heavy precipitation fell in all parts of the State.

In southwestern Oklahoma, monthly mean discharge at the index station, Washita River near Durwood, increased sharply as a result of heavy rains during the month but remained in the normal range. To the northeast, a new peak of record occurred at Baron Fork at Eldon (drainage area, 307 square miles) where a maximum discharge of 38,000 cfs occurred on April 20 with a recurrence interval of 20 years.

By contrast, in adjacent Arkansas, flow at both index stations was less than 50 percent of median and in the below-normal range.

In northern Louisiana, flow of Saline Bayou near Lucky decreased seasonally and was in the below-normal range. Flows in the remainder of the State were in the normal range.

In south-central Texas, monthly mean discharge in Guadalupe River near Spring Branch increased seasonally, to nearly 3 times the median discharge and was in the above-normal range. Elsewhere in the State, streamflow was in the normal range, except in a small area in the northeast where runoff from above-normal rains resulted in above-normal streamflow, and in part of the Panhandle area in the northwest where flows were below normal.

Ground-water levels declined slightly in Kansas and Nebraska (except for rises in east-central and southeastern prats of State); and declined also in Louisiana. In southwestern Louisiana, levels in the artesian Chicot aquifer fell 14 feet in the key observation well, were lowest of record (35 years) for end of April, and reflected seasonal pumping for rice irrigation influenced by an unusually dry spring season. In North Dakota, monthend levels were above average in the north and east, and near average in the remainder of the State. In Iowa, levels were above average in the north and near average in the south. In the rice growing area of east-central Arkansas, the level in the shallow aquifer rose slightly and was in the same range of values that have prevailed since 1964; the level rose in the deep aquifer and was below average. In the industrial aquifer of central and southern Arkansas, the level was unchanged at Pine Bluff and rose at El Dorado; monthend levels were below average at Pine Bluff and near average at El Dorado. In Texas, levels rose in the Edwards Limestone at San Antonio, in the Evangeline aquifer at Houston, and in the bolson deposits at El Paso. Levels declined in the Edwards Limestone at Austin. Monthend levels were above average at Austin and San Antonio; and were lowest of record for end of April at Houston and El Paso.

WEST

[Alberta and British Columbia; Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming]

STREAMFLOW INCREASED SEASONALLY IN ALBERTA, BRITISH COLUMBIA, IDAHO, MONTANA, WYOMING, AND UTAH, AND WAS VARIABLE ELSEWHERE IN THE REGION. FLOWS REMAINED IN THE BELOW-NORMAL RANGE IN PARTS OF CALIFORNIA, COLORADO, UTAH, AND WASHINGTON, AND DECREASED INTO THAT RANGE IN PARTS OF NEW MEXICO. ABOVE-NORMAL FLOWS PERSISTED IN PARTS OF MONTANA. MONTHLY AND DAILY MEAN DISCHARGES WERE LOWEST OF RECORD AT SOME INDEX STATIONS.

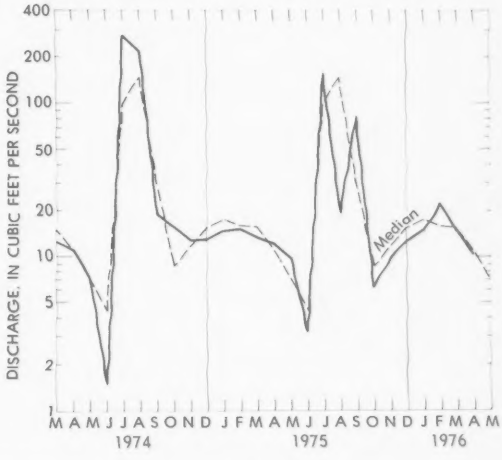
In northern California, where monthly mean discharge in North Fork American River at North Fork Dam (drainage area, 342 square miles) was in the below-normal range in January, February, and March, the mean flow of 410 cfs in April also was in that range, was only 25 percent of median, and was lowest for April since records began in 1911. The previous minimum monthly mean discharge in April was 548 cfs in 1924. This stream is tributary to Sacramento River from the west slope of the Sierra Nevada. Downstream, the monthly mean discharge of Sacramento River at Verona decreased seasonally, remained below the normal range for the 4th consecutive month, and was only one-half of median. In the central part of the State, monthly mean flow of Kings River above North Fork, near Trimmer, also remained in the below-normal range for the 4th consecutive month and was about one-third of the April median flow.

In Virgin River, in extreme southwestern Utah and the adjacent areas of Nevada and Arizona, where monthly mean discharge, as measured at Littlefield, Ariz. (drainage area, 5,090 square miles) was below the normal range in 6 of the 7 months, September 1975 through March 1976, mean flow during April was in the normal range but the daily mean discharge of 49 cfs on April 5 was lowest for the month since records began in October 1929. Also in southwestern Utah, monthly mean flow of Beaver River near Beaver increased seasonally but remained below the normal range and was about one-half the April median. In the northeastern part of the State, monthly mean discharge of Whiterocks River near Whiterocks remained in the below-normal range for the 7th consecutive month. In north-central Utah, the level of Great Salt Lake rose 0.40 foot during the month (to 4,202.05 feet above mean sea level), 1.15 feet higher than a year ago, and the highest level since 1928. The maximum level previously observed in April was 4,205.1 feet above mean sea level, in 1924.

In the adjacent State of Colorado, monthly mean flows increased seasonally and were in the normal range at all index stations except Arkansas River at Canon City, where monthly mean discharge decreased contraseasonally and remained below the normal range for the 4th consecutive month.

In New Mexico, monthly mean discharge was in the normal range except in Pecos River at Santa Rosa, where the mean flow during April decreased contraseasonally, was only 34 percent of median, and was below the normal range.

In Arizona, monthly mean flows increased in northern and central basins but decreased seasonally in the Gila and San Pedro River basins in the southeastern part of the State. Flow of San Pedro River at Charleston continued to decrease seasonally and was only slightly less than median (see graph).



Monthly mean discharge of San Pedro River at Charleston, Ariz. (Drainage area, 1,219 sq mi; 3,157 sq km)

In the northern part of the region, monthly mean discharge in Clark Fork at St. Regis, in western Montana and west of the Continental Divide, increased seasonally as a result of runoff from snowmelt and spring rains, and remained in the above-normal range for the 11th consecutive month. In the south-central part of the State, mean flow in Yellowstone River at Billings was in the above-normal range for the 10th time in the past 11 months, and for the 7th consecutive month. Cumulative runoff at that index station during the first 7 months of the 1976 water year was 450,000 acre-feet greater than median.

(Continued on page 13).

Provisional data; subject to revision

DISSOLVED SOLIDS AND WATER TEMPERATURES FOR APRIL AT DOWNSTREAM SITES ON SIX LARGE RIVERS

Station number	Station name	April data of following calendar years	Stream discharge during month	Dissolved-solids concentration during month[a]		Dissolved-solids discharge during month[a]			Water temperature during month		
			Mean (cfs)	Minimum (mg/l)	Maximum (mg/l)	Mean	Minimum	Maximum	Mean, in °C	Minimum, in °C	Maximum, in °C
						(tons per day)					
	NORTHEAST										
01463500	Delaware River at Trenton, N.J.	1976	13,830	74	109	3,520	1,890	7,490	13.5 (56°F)	7.5 (46°F)	22.5 (72°F)
	(Morrisville, Pa.)	1945–75	22,000	46 (Apr. 11, 1962)	113 (Apr. 18, 1964)	....	1,240 (Apr. 21, 1966)	12,300 (Apr. 1–10, 1960)	....	3.0 (38°F)	21.0 (70°F)
			[21,180[b]]								
04264331	St. Lawrence River at Cornwall, Ontario, near	1976	305,500	166	168	138,000	124,000	146,000	4.5 (40°F)	2.0 (36°F)	6.5 (44°F)
	Massena, N.Y. (streamflow station formerly at Ogdensburg, N.Y.)	1966–74	265,200	.....	.....	.....	.....	.....	3.5 (38°F)	0.5 (33°F)	7.5 (46°F)
			[250,500[b]]								
	SOUTHEAST										
07289000	Mississippi River at Vicksburg, Miss	1976	673,500	185	238	365,000	291,000	429,000	16.5 (62°F)	14.5 (58°F)	20.0 (68°F)
			[981,200[b]]								
	WESTERN GREAT LAKES REGION										
03612500	Ohio River at lock and dam 53, near Grand Chain, Ill.	1976	215,700	165	216	.....	22,400	262,000	....	13.0 (56°F)	18.5 (66°F)
	(25 miles west of Paducah, Ky.; streamflow station at at Metropolis, Ill.)	1955–75,	465,000	117 (Apr. 1, 1957)	282 (Apr. 8, 1969)	.....	67,100 (Apr. 6, 1966)	462,000 (Apr. 2, 5, 1975)	....	6.5 (44°F)	19.0 (66°F)
			[450,800[b]]								
	MIDCONTINENT										
06934500	Missouri River at Hermann, Mo. (60 miles west of St. Louis, Mo.)	1976	97,100	260	433	87,400	65,200	143,000	14.5 (58°F)	10.5 (51°F)	17.5 (64°F)
			[95,600[b]]								
	WEST										
14128910	Columbia River at Warrendale, Oreg.	1976	266,700	85	108	68,700	46,100	90,500	9.5 (49°F)	8.0 (46°F)	10.0 (50°F)
	(30 miles east of Portland, Oreg.; streamflow station at The Dalles, Oreg.)	1968–73	217,100	.....	.....	.....	.....	.....	....	6.0 (43°F)	11.0 (52°F)
			[190,600[b]]								

[a]Dissolved-solids concentrations when not analyzed directly, are calculated on basis of measurements of specific conductance.
[b]Median of monthly values for 30-year reference period, water years 1941–70, for comparison with data for current month.

USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END OF APRIL 1976

[Contents are expressed in percent of reservoir capacity. The usable storage capacity of each reservoir is shown in the column headed "Normal maximum."]

Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	End of Mar. 1976	End of Apr. 1976	End of Apr. 1975	Average for end of Apr.	Normal maximum
	Percent of normal maximum				
NORTHEAST REGION					
NOVA SCOTIA					
Rossignol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook Reservoirs (P)	86	86	63	76	223,400 (a)
QUEBEC					
Allard (P)	41	94	49	123	280,600 ac-ft
Gouin (P)	53	64	53	72	6,954,000 ac-ft
MAINE					
Seven reservoir systems (MP)	51	97	47	65	178,500 mcf
NEW HAMPSHIRE					
First Connecticut Lake (P)	21	80	17	47	3,330 mcf
Lake Francis (FPR)	25	67	31	52	4,326 mcf
Lake Winnipesaukee (PR)	73	92	93	97	7,200 mcf
VERMONT					
Harriman (P)	57	92	62	77	5,060 mcf
Somerset (P)	79	79	68	74	2,500 mcf
MASSACHUSETTS					
Cobble Mountain and Borden Brook (MP)	82	85	89	88	3,394 mcf
NEW YORK					
Great Sacandaga Lake (FPR)	81	100	90	90	34,270 mcf
Indian Lake (FMP)	58	88	62	91	4,500 mcf
New York City reservoir system (MW)	98	99	99	.....	547,500 mg
NEW JERSEY					
Wanaque (M)	100	98	99	94	27,730 mg
PENNSYLVANIA					
Allegheny (FPR)	.....	.....	.....	.....	51,400 mcf
Pymatuning (FMR)	95	95	96	98	8,191 mcf
Raystown Lake (FR)	.....	.....	.....	.....	16,490 mcf
Lake Wallenpaupack (PR)	60	72	74	79	6,875 mcf
MARYLAND					
Baltimore municipal system (M)	100	100	100	94	85,340 mg
SOUTHEAST REGION					
NORTH CAROLINA					
Bridgewater (Lake James) (P)	79	89	95	93	12,580 mcf
Narrows (Badin Lake) (P)	93	93	99	102	5,617 mcf
High Rock Lake (P)	64	72	81	85	10,230 mcf
SOUTH CAROLINA					
Lake Murray (P)	89	90	91	8	70,300 mcf
Lakes Marion and Moultrie (P)	87	86	85	80	81,100 mcf
SOUTH CAROLINA--GEORGIA					
Clark Hill (FP)	77	77	77	75	75,360 mcf
GEORGIA					
Burton (PR)	86	93	96	92	104,000 ac-ft
Sinclair (MPR)	87	88	92	92	214,000 ac-ft
Lake Sidney Lanier (FMPR)	70	66	65	63	1,686,000 ac-ft
ALABAMA					
Lake Martin (P)	100	96	99	95	1,373,000 ac-ft
TENNESSEE VALLEY					
Clinch Projects: Norris and Melton Hill Lakes (FPR)	49	58	73	62	1,156,000 cfsd
Douglas Lake (FPR)	28	49	66	61	703,100 cfsd
Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parksville Lakes (FPR)	62	75	86	78	510,300 cfsd
Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR)	52	61	83	66	1,452,000 cfsd
Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR)	59	73	86	78	745,200 cfsd
WESTERN GREAT LAKES REGION					
WISCONSIN					
Chippewa and Flambeau (PR)	45	98	65	69	15,900 mcf
Wisconsin River (21 reservoirs) (PR)	48	88	60	70	17,400 mcf
MINNESOTA					
Mississippi River headwater system (FMR)	17	26	40	31	1,640,000 ac-ft
MIDCONTINENT REGION					
NORTH DAKOTA					
Lake Sakakawea (Garrison) (FIPR)	88	88	88	.....	22,640,000 ac-ft
SOUTH DAKOTA					
Angostura (I)	72	74	86	85	127,600 ac-ft
Bell Fourche (I)	65	....	82	70	185,200 ac-ft
Lake Francis Case (FIP)	80	80	88	83	4,834,000 ac-ft
Lake Oahe (FIP)	84	84	88	.....	22,530,000 ac-ft
MIDCONTINENT REGION--Continued					
SOUTH DAKOTA--Continued					
Lake Sharpe (FIP)	103	101	101	99	1,725,000 ac-ft
Lewis and Clarke Lake (FIP)	80	79	81	83	477,000 ac-ft
NEBRASKA					
Lake McConaughy (IP)	82	84	84	78	1,948,000 ac-ft
OKLAHOMA					
Eufaula (FPR)	86	106	102	91	2,378,000 ac-ft
Keystone (FPR)	86	91	99	118	661,000 ac-ft
Tenkiller Ferry (FPR)	102	123	103	96	628,200 ac-ft
Lake Altus (FIMR)	95	98	67	54	134,500 ac-ft
Lake O'The Cherokees (FPR)	75	95	94	91	1,492,000 ac-ft
OKLAHOMA--TEXAS					
Lake Texoma (FMPRW)	88	99	99	92	2,722,000 ac-ft
TEXAS					
Bridgeport (IMW)	83	86	71	47	386,400 ac-ft
Canyon (FMR)	93	99	98	66	385,600 ac-ft
International Amistad (FIMPW)	100	100	100	68	3,497,000 ac-ft
International Falcon (FIMPW)	85	86	94	64	2,667,000 ac-ft
Livingston (IMW)	100	100	100	71	1,788,000 ac-ft
Possum Kingdom (IMPRW)	89	91	90	98	569,400 ac-ft
Red Bluff (PI)	34	33	54	26	307,000 ac-ft
Toledo Bend (P)	95	92	93	84	4,472,000 ac-ft
Twin Buttes (FIM)	98	99	100	10	177,800 ac-ft
Lake Kemp (IMW)	78	77	50	88	268,000 ac-ft
Lake Meredith (FMW)	42	41	47	36	821,300 ac-ft
Lake Travis (FIMPRW)	93	95	100	78	1,144,000 ac-ft
THE WEST					
WASHINGTON					
Ross (PR)	48	35	0	25	1,052,000 ac-ft
Franklin D. Roosevelt Lake (IP)	24	7	8	46	5,232,000 ac-ft
Lake Chelan (PR)	65	53	12	39	676,100 ac-ft
Lake Cushman	72	75	79	89	359,500 ac-ft
Lake Merwin (P)	102	102	96	100	246,000 ac-ft
IDAHO					
Boise River (4 reservoirs) (FIP)	66	76	54	71	1,235,000 ac-ft
Coeur d'Alene Lake (P)	59	102	98	130	238,500 ac-ft
Pend Oreille Lake (FP)	57	51	51	58	1,561,000 ac-ft
IDAHO--WYOMING					
Upper Snake River (9 reservoirs) (MP)	62	54	61	71	4,689,000 ac-ft
WYOMING					
Boysen (FIP)	60	52	64	59	802,000 ac-ft
Buffalo Bill (IP)	54	43	56	61	421,300 ac-ft
Keyhole (F)	70	70	74	42	199,900 ac-ft
Pathfinder, Seminoe, Alcova, Kortes, Glendo, and Guernsey Reservoirs (I)	68	71	69	49	3,056,000 ac-ft
COLORADO					
John Martin (FIR)	3	0	0	15	364,400 ac-ft
Taylor Park (IR)	57	55	47	57	106,200 ac-ft
Colorado–Big Thompson project (I)	69	71	69	57	722,600 ac-ft
COLORADO RIVER STORAGE PROJECT					
Lake Powell; Flaming Gorge, Navajo, and Blue Mesa Reservoirs (IFPR)	79	79	70	.....	31,280,000 ac-ft
UTAH--IDAHO					
Bear Lake (IPR)	73	80	80	62	1,421,000 ac-ft
CALIFORNIA					
Folsom (FIP)	63	63	67	73	1,000,000 ac-ft
Hetch Hetchy (MP)	26	....	12	37	360,400 ac-ft
Isabella (FIR)	28	28	39	29	551,800 ac-ft
Pine Flat (FI)	51	54	57	59	1,014,000 ac-ft
Clair Engle Lake (Lewiston) (P)	76	80	88	91	2,438,000 ac-ft
Lake Almanor (P)	53	56	85	56	1,036,000 ac-ft
Lake Berryessa (FIMW)	82	80	101	90	1,600,000 ac-ft
Millerton Lake (FI)	71	76	75	68	503,200 ac-ft
Shasta Lake (FIPR)	73	70	101	92	4,377,000 ac-ft
CALIFORNIA--NEVADA					
Lake Tahoe (IPR)	66	63	75	61	744,600 ac-ft
NEVADA					
Rye Patch (I)	109	103	83	.....	157,200 ac-ft
ARIZONA--NEVADA					
Lake Mead and Lake Mohave (FIMP)	78	78	75	64	27,970,000 ac-ft
ARIZONA					
San Carlos (IP)	10	8	23	18	1,093,000 ac-ft
Salt and Verde River system (IMPR)	63	67	70	49	2,073,000 ac-ft
NEW MEXICO					
Conchas (FIR)	23	23	38	76	352,600 ac-ft
Elephant Butte and Caballo (FIPR)	27	25	17	27	2,539,000 ac-ft

[a]Thousands of kilowatt-hours.

FLOW OF LARGE RIVERS DURING APRIL 1976

Station number*	Stream and place of determination	Drainage area (square miles)	Mean annual discharge through September 1970 (cfs)	April 1976					
				Monthly discharge (cfs)	Percent of median monthly discharge, 1941–70	Change in discharge from previous month (percent)	Discharge near end of month		
							(cfs)	(mgd)	Date
1–0140	St. John River below Fish River at Fort Kent, Maine.	5,690	9,397	52,600	253	+777	47,000	30,000	30
1–3185	Hudson River at Hadley, N.Y	1,664	2,791	11,600	137	+60	7,000	4,500	30
1–3575	Mohawk River at Cohoes, N.Y	3,456	5,450	11,800	92	-28	.....	.....	....
1–4635	Delaware River at Trenton, N.J	6,780	11,360	13,310	63	-22	6,130	3,960	26
1–5705	Susquehanna River at Harrisburg, Pa.	24,100	33,670	37,490	54	-35	35,000	22,600	30
1–6465	Potomac River near Washington, D.C.	11,560	[1]10,640	12,810	74	+11	5,560	3,590	30
2–1055	Cape Fear River at William O. Huske Lock near Tarheel, N.C.	4,810	4,847	2,268	39	-42	1,090	700	30
2–1310	Pee Dee River at Peedee, S.C	8,830	9,098	6,700	52	-22	2,610	1,690	27
2–2260	Altamaha River at Doctortown, Ga.	13,600	13,380	18,710	78	-12	7,080	4,580	28
2–3205	Suwannee River at Branford, Fla	7,740	6,775	4,890	47	-14	3,560	2,300	29
2–3580	Apalachicola River at Chattahoochee, Fla.	17,200	21,690	28,900	134	-29	17,200	11,200	29
2–4670	Tombigbee River at Demopolis lock and dam near Coatopa, Ala.	15,400	21,700	57,580	159	-24	13,200	8,500	28
2–4895	Pearl River near Bogalusa, La	6,630	8,533	31,880	246	+17	4,400	2,840	30
3–0495	Allegheny River at Natrona, Pa	11,410	[1]18,700	15,600	43	-64	14,500	9,370	30
3–0850	Monongahela River at Braddock, Pa.	7,337	[1]11,950	11,300	62	-13	6,400	4,100	30
3–1930	Kanawha River at Kanawha Falls, W.Va.	8,367	12,370	8,810	55	-13	3,700	2,400	28
3–2345	Scioto River at Higby, Ohio	5,131	4,337	1,752	24	-65	1,500	970	28
3–2945	Ohio River at Louisville, Ky[2]	91,170	110,600	93,600	49	-45	41,600	26,900	30
3–3775	Wabash River at Mount Carmel, Ill.	28,600	26,310	19,990	43	-65	12,000	7,800	30
3–4690	French Broad River below Douglas Dam, Tenn.	4,543	[1]6,528	6,861	72	+8	.....	.....	....
4–0845	Fox River at Rapide Croche Dam, near Wrightstown, Wis.[2]	6,150	4,142	6,198	93	+3	.....	.....	....
02MC002 (4–2643.31)	St. Lawrence River at Cornwall, Ontario–near Massena, N.Y.[3]	299,000	239,100	305,500	122	+6	320,000	207,000	30
050115	St. Maurice River at Grand Mere, Quebec.	16,300	24,900	95,300	229	+1,026	101,000	65,000	26
5–0825	Red River of the North at Grand Forks, N. Dak.	30,100	2,439	9,247	105	+293	5,000	3,200	30
5–3300	Minnesota River near Jordan, Minn ..	16,200	3,306	3,698	46	+19	2,140	1,380	30
5–3310	Mississippi River at St. Paul, Minn ...	36,800	[1]10,230	21,800	80	+64	12,800	8,300	29
5–3655	Chippewa River at Chippewa Falls, Wis.	5,600	5,062	17,790	182	+116	.....	.....	....
5–4070	Wisconsin River at Muscoda, Wis	10,300	8,457	29,740	194	+83	.....	.....	....
5–4465	Rock River near Joslin, Ill	9,520	5,288	10,300	123	-33	16,000	10,300	30
5–4745	Mississippi River at Keokuk, Iowa ...	119,000	61,210	156,000	133	+51	196,000	127,000	30
5–4855	Des Moines River below Raccoon River at Des Moines, Iowa.	9,879	3,796	6,675	131	+100	6,830	4,410	30
6–2145	Yellowstone River at Billings, Mont.	11,795	6,754	5,374	146	+54	7,000	4,500	30
6–9345	Missouri River at Hermann, Mo	528,200	78,480	97,470	102	+24	187,000	121,000	28
7–2890	Mississippi River at Vicksburg, Miss.[4]	1,144,500	552,700	673,500	69	-25	530,000	343,000	27
7–3310	Washita River near Durwood, Okla ..	7,202	1,379	1,805	167	+104	800	520	30
8–3130	Rio Grande at Otowi Bridge, near San Ildefonso, N.Mex.	14,300	1,530	1,648	126	+60	.....	.....	....
9–3150	Green River at Green River, Utah ...	40,600	6,369	5,611	82	+11	7,000	4,500	28
11–4255	Sacramento River at Verona, Calif ...	21,257	18,370	11,400	51	-7	8,550	5,530	28
13–2690	Snake River at Weiser, Idaho	69,200	17,670	43,630	207	+57	41,600	26,900	27
13–3170	Salmon River at White Bird, Idaho ..	13,550	11,060	13,490	128	+145	13,800	8,900	26
13–3425	Clearwater River at Spalding, Idaho ..	9,570	15,320	33,040	113	+57	22,400	14,500	27
14–1057	Columbia River at The Dalles, Oreg.[5]	237,000	194,000	266,700	140	+22	.....	.....	....
14–1910	Willamette River at Salem, Oreg	7,280	23,370	25,150	94	-1	32,280	20,900	26–30
15–5155	Tanana River at Nenana, Alaska	25,600	24,040	5,270	78	+14	6,200	4,000	30
8MF005	Fraser River at Hope, British Columbia.	78,300	95,300	80,200	135	+145	111,000	72,000	29

[1]Adjusted.

[2]Records furnished by Corps of Engineers.

[3]Records furnished by Buffalo District, Corps of Engineers, through International St. Lawrence River Board of Control. Discharges shown are considered to be the same as discharge at Ogdensburg, N.Y. when adjusted for storage in Lake St. Lawrence.

[4]Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.

[5]Discharge determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.

*The U.S. station numbers as listed in this table are in a shortened form previously in use, and used here for simplicity of tabular and map presentation. The full, correct number contains 8 digits and no punctuation marks. For example, the correct form for station number 1–3185 is 01318500.

(Continued from page 9).

In Alberta, Idaho, and Wyoming, monthly mean flows increased seasonally and were near or slightly greater than median at all index stations. In Oregon, flows increased at some stations and decreased at others but were in the normal range. In northwestern Washington, monthly mean discharge of Skykomish River near Gold Bar increased seasonally but remained below the normal range. Elsewhere in the State, flows were in the normal range and slightly greater than median.

In the adjacent Province of British Columbia, monthly mean flow of Fraser River at Hope increased seasonally, was above the normal range, and was greater than median for the 6th consecutive month.

Storage in major reservoirs generally was above average at monthend except in Idaho and northern California, where it was slightly below average. The net increase in storage in the Colorado River Storage Project was 4,670 acre-feet during the month.

Ground-water levels rose in most of Washington (except extreme northwestern part), northern Idaho, north-central Nevada (Paradise well), and east-central Nevada (Steptoe well). Levels generally declined in Montana, Utah (except for a rise at Holladay well in north), southern Idaho (Boise Valley and Snake River Plain), and in southern Arizona. In southern New Mexico, levels fluctuated only slightly except for declining levels in key observation wells in the Mimbres Valley and in the Roswell artesian basin of the Pecos Valley. Monthend levels were generally above average in Washington, northern Idaho (Rathdrum Prairie), parts of southern Idaho (Boise Valley and at Atomic City in east), east-central Nevada (alltime high at Steptoe), and in parts of northern and southeastern Utah (Logan and Blanding, respectively). Levels were near average in Montana, and were below average in part of extreme southern Idaho (Rupert-Minidoka area), part of central and extreme northern Utah (Flowell and Holladay, respectively), extreme west-central and southern Nevada (Truckee Meadows and Las Vegas, respectively), and in southern New Mexico.

ALASKA

Streamflow increased seasonally in the interior basins of Chena and Tanana Rivers but, as a result of low carryover flow from March and a below-average seasonal increase in flow in Tanana River basin, the monthly mean discharge of 5,270 cfs at Nenana (drainage area, 25,600 square miles) was lowest for the month in record that began in 1963. The previous minimum monthly mean flow observed in April was 5,870 cfs in 1963. In Chena River at Fairbanks, monthly mean flow was greater than median for the first time since September 1975. In south-central Alaska, monthly mean discharge in Little Susitna River near Palmer decreased contraseasonally and was below the normal range for the first time since May 1975. In the south-coastal basin of Kenai River, monthly mean flow at Cooper Landing remained essentially the same as in March and was in the normal range for the 4th consecutive month. In the southeast-coastal basin of Gold Creek, mean flow during April at the index station near Juneau increased seasonally but the increase was less than normal and the resulting monthly mean discharge was only about one-half of median for the month.

Ground-water levels in the Anchorage area generally declined in confined aquifers; but began a seasonal spring rise in some shallow water-table wells. Monthend levels in the confined aquifers approached or slightly exceeded alltime low levels near the centers of heavy pumping.

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TECHNICAL STAFF
J.C. Kammerer, Editor-in-Chief
H.D. Brice, Associate Editor
C.W. Saboe
T.H. Woodard
R.M. Kosco

COPY PREPARATION
L.C. Fleshmon, Chief
S.L. Peterson
D.L. Radcliffe

EXPLANATION OF DATA

Cover map shows generalized pattern of streamflow for April based on 22 index stream-gaging stations in Canada and 130 index stations in the United States. Alaska and Hawaii inset maps show streamflow only at the index gaging stations which are located near the points shown by the arrows.

Streamflow for April 1976 is compared with flow for April in the 30-year reference period 1931–60 or 1941–70. Streamflow is considered to be *below the normal range* if it is within the range of the low flows that have occurred 25 percent of the time (below the lower quartile) during the reference period. Flow for April is considered to be *above the normal range* if it is within the range of the high flows that have occurred 25 percent of the time (above the upper quartile).

Flow higher than the lower quartile but lower than the upper quartile is described as being within the *normal range*. In the Water Resources Review the median is obtained by ranking the 30 flows of the reference period in their order of magnitude; the highest flow is number 1, the lowest flow is number 30, and the average of the 15th and 16th highest flows is the median.

The normal is an average (but not an arithmetic average) or middle value; half of the time you would expect the April flows to be below the median and half of the time to be above the median. Shorter reference periods are used for the Alaska index stations because of the limited records available.

Statements about *ground-water levels* refer to conditions near the end of April. Water level in each key observation well is compared with average level for the end of April determined from the entire past record for that well or from a 20-year reference period, 1951–70. *Changes in ground-water levels*, unless described otherwise, are from the end of March to the end of April.

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SELECTED DATA ON HIGH FLOWS IN NORTHERN NORTH DAKOTA, 1903–75

The accompanying tables list average and peak discharges for the entire period of record at nine stream-gaging stations in the Pembina and Souris River basins in northern North Dakota, 1903–75, an area that was severely flooded during April 1976. Locations of the stations are shown on page 6 of this issue. Seasonal peak discharges on these streams usually occur in April or May, a result of runoff from snowmelt, and at times augmented by runoff from rainfall. A large number of the highest peak discharges have occurred during recent years, most notably in 1969, 1974, and 1975.

Station number	Stream	Length of record (years)	Average discharge		
			Entire period of record (cfs)	Aprils only, entire period (cfs)	Aprils only 1969–75 (cfs)
05100000	Pembina River	67	191	733	1,711
05114000	Souris River	45	123	664	1,388
05116000	...do	40	128	429	1,011
05116500	Des Lacs River	32	29	127	251
05117500	Souris River	72	157	634	1,246
05120000	...do	38	194	595	1,198
05120500	Wintering River	38	12.4	60	100
05122000	Souris River	38	211	502	898
05124000	...do	45	232	643	1,473

Peak discharges at nine stream-gaging stations in Pembina and Souris River basins, North Dakota, 1903–75

Station number Stream and location	Drainage area (sq mi)	Period of record	Peak discharge (in order of rank)			
			Discharge (cfs)	Date	Discharge (cfs)	Date
05100000	3,410	May 1903–Sept. 1908,	10,700	Apr. 20, 1950	*6,190	May 23, 1974
Pembina River at Neche.	(8,830	June 1909–Sept. 1915,	10,300	Apr. 28, 1974	5,320	May 12, 1950
	sq km)	Apr. 1919–Sept. 1975	7,360	Apr. 21, 1969	5,200	Apr. 27, 1956
			7,350	Apr. 12, 1971	5,010	Apr. 22, 1949
			7,070	Apr. 27, 1970		
05114000	[a]8,940	Mar. 1930–Sept. 1975	12,400	Apr. 11, 1969	6,400	Apr. 19, 1974
Souris (Mouse) River near Sherwood.	(23,150		7,400	Apr. 28, 1948	5,320	Apr. 12, 1943
	sq km)		6,810	May 5, 1975	5,210	Apr. 5,1955
05116000	[b]9,470	June 1904–Nov. 1905,	5,380	Apr. 17, 18,	3,040	May 16, 1948
Souris (Mouse) River near Foxholm.	(24,530	Mar.–July 1906,		1969	2,990	Apr. 25, 1943
	sq km)	Oct. 1936–Sept. 1975	5,260	May 23, 1975	2,810	May 19, 1970
			3,400	Apr. 23, 1974		
05116500	[c]939	June 1904–July 1906,	3,660	Apr. 30, 1970	2,000	Apr. 4, 1949
Des Lacs River at Foxholm.	(2,430	Oct. 1945–Sept. 1975	2,670	Apr. 29, 1975	1,800	Apr. 6, 1951
	sq km)		2,460	Apr. 10, 1969		
05117500	[d]10,600	May 1903–Sept. 1975	12,000	Apr. 20, 1904	3,530	Apr. 25, 1974
Souris (Mouse) River above Minot.	(27,450		6,020	Apr. 19, 1969	3,460	Apr. 30, 1923
	sq km)		5,700	May 13, 1975	3,450	Apr. 18, 1925
			4,260	May 6, 1916	3,320	May 12, 1970
			3,900	Apr. 30, 1927		
05120000	[e]11,300	Apr. 1937–Sept. 1975	5,960	Apr. 30, 1969	3,700	May 15, 1970
Souris (Mouse) River near Verendrye.	(29,300		5,510	May 24, 1975	3,430	May 18, 1974
	sq km)		4,200	Apr. 8,1949	2,710	Apr. 12, 1951
05120500	[f]705	Mar. 1937–Sept. 1975	3,000	Apr. 7,1949	667	May 2, 1970
Wintering River near Karlsruhe.	(1,826		1,480	Apr. 11, 1969	575	May 2,1975
	sq km)		750	Apr. 7,1971	530	Apr. 2, 1943
05122000	[g]12,300	Mar. 1937–Sept. 1975	5,750	May 25, 1975	3,640	May 22, 1970
Souris (Mouse) River near Bantry.	(31,860		5,660	May 4,1969	3,350	May 22, 1974
	sq km)		4,760	Apr. 13, 1949		
05124000	[h]16,900	July–Oct. 1929,	6,700	May 7, 1975	3,120	June 6, 1970
Souris (Mouse) River near Westhope.	(43,800	Apr. 1930–Sept. 1975	6,400	Apr. 18, 1949	3,100	Apr. 29, 1951,
	sq km)		6,300	Apr. 22, 1969		May 1,1951
			5,610	Apr. 25, 1974	3,060	Apr. 20, 1972
			3,500	Apr. 14, 1955	3,040	May 21, 1956

*Daily mean discharge; other data are instantaneous discharges.
Probable noncontributing drainage areas:
[a]About 5,900 sq mi (15,300 sq km).
[b]About 6,200 sq mi (16,100 sq km).
[c]About 400 sq mi (1,040 sq km).
[d]About 6,700 sq mi (17,400 sq km).
[e]About 6,900 sq mi (17,900 sq km).
[f]About 420 sq mi (1,090 sq km).
[g]About 7,600 sq mi (19,680 sq km).
[h]About 10,300 sq mi (26,700 sq km).

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